Summary of the Researches on the Influence of Investor Sentiment on Stock Returns Under the Background of Big Data

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Abstract. In order to analyze the promoting effect of big data technology on research results, and to explore the impact of investor sentiment on stock returns, this paper combs and summarizes the research results of domestic and foreign scholars on the impact of investor sentiment on stock returns under the background of big data. This paper defines the concepts of big data, investor sentiment and stock returns, analyzes the measurement methods of investor sentiment, and deeply analyzes the overall effect and cross-sectional effect of investor sentiment on stock returns under the background of living alone. The results show that big data technology plays a strong role in promoting the research results, can comprehensively analyze various influencing factors, and investor sentiment has a great impact on stock returns.

Keywords: Big data; Big data technology; Investor sentiment; Stock returns.

1. Introduction

Due to the epidemic, more and more citizens begin to put some spare money into the stock market in order to get higher returns. However, it is worth noting that in recent years, according to the data obtained by big data, China's stock market has skyrocketed and plummeted frequently in recent years, therefore, the traditional scientific market theory is difficult to explain the current situation of the stock market. At present, more and more researchers have begun to conduct in-depth analysis and research on the returns of the stock market from the perspective of investor sentiment. At the same time, most experts and professors have made in-depth investigation and analysis according to the current situation of China's stock market, and believe that investor sentiment can have a certain impact on stock returns. At present, more and more domestic and foreign experts and professors use empirical analysis methods to analyze the impact of investor sentiment and stock returns. At the same time, according to the technical analysis of big data, the author finds that there are many short-term speculators in China's stock market, and the relevant legal system of China's stock market is not yet perfect. Compared with the stock markets of most developed countries, China's stock market is more likely to rise and fall. At the same time, from another point of view, the sentiment of stock investors seems to have a more significant impact on the future trend of China's stock market. Therefore, this paper believes that, under the current background of big data, according to the information collected by big data technology, combined with the research results of domestic and foreign scholars on the impact of investor sentiment on stock returns, it can more scientifically analyze the future development prospects of China's stock market, and it also has a far-reaching impact on the development of China's capital market.

2. Theoretical Basis

2.1 Big Data

Big data, in essence, proves a sort of data integration, which cannot be captured by conventional data tools, within a certain period. In addition, big data, to be frank, needs stronger decision-making to control and needs stronger insight to discover. On the whole, there remain five main characteristics, such as respectively, volume, velocity, variety, value and veracity. In immerse amounts of subjects, they, in essence, are based on big data and big data technology, respectively, such as computer, information science and statistics. At the same time, big data, to be sure, has been made the most of in immerse amounts of industries, such as respectively, business intelligence, industry 4.0, cloud computing, things of Internet and Internet+. Furthermore, big data, in essence, can be made the full advantage of by a sea of experts and professors, to be frank, in all walks of life, which can combine organically and scientifically with other fields, or technologies. At the same time, when there remains an organic and scientific integration of big data and cloud computing, there can be more values for private individuals in all walks of life.

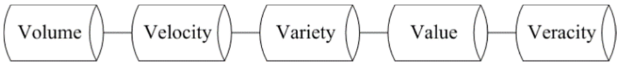

Figure 1 The main features of big data

2.2 Investor Sentiment

Investor sentiment is one of the important terms in the stock market, and it also indirectly reflects investors' views on the future trend of the stock market. Investor sentiment can be divided into three categories: they think that the trend of the stock market price in the future is relatively stable, or that the trend of the stock market price in the future shows an overall upward trend, or that the overall trend of the stock market in the future shows a downward trend. In addition, different investors have different investment sentiment, which makes different investors have different investment behavior. At the same time, investor sentiment can not be measured, it mainly reflects a trend, or reflects the current state of investors.

Investor sentiment, from the perspective of investors, is an objective concept or object. Different investors have their own unique views in the face of the fluctuations of the stock market. therefore, different investors have different feelings about the investment market because of their own factors, such as stock position, investment style, social status and so on. At the same time, these emotions also have a more important impact on the investment behavior of investors. However, it is worth noting that investor sentiment is not only difficult to use accurate data to strategy, but also an unstable factor, which is closely related to the subjective judgment of investors. In addition, different investors have different emotions towards the stock market, but the same or similar emotions produced by most investors can be used as certain judgment criteria and evaluation criteria. Usually, in the face of positive news in the market, investors will be in high spirits and hold money to buy the stocks they like. However, when investors find negative news in the market, many investors will stop buying stocks. They even redeem the shares they own.

At present, the academic circles have not established a unified measurement standard for the economic term investor sentiment. Some experts and professors believe that the investment behavior of investors based on their own investment views and the prediction of the future price of the stock market is investment sentiment. At the same time, some scholars believe that investment sentiment is a subjective concept, which is the true embodiment of investors' views on the future development trend and price fluctuation of the stock market. Therefore, the author believes that investor sentiment, generally speaking, is the subjective judgment of individual investors on the rise or fall of the stock market for a period of time in the future. This subjective judgment is mainly divided into optimistic judgment and pessimistic judgment.

Different financial researchers have different views on the concept of investor sentiment. Black (1986), a foreign research scholar, analyze and expound investor sentiment, and believe that investor sentiment refers to investors' expectations of the future of the capital market. Delong et al. (1990) also analyze the name investor sentiment and compared investor sentiment to "noise", believing that it can affect or interfere with the capital market, and it also belongs to the cognitive bias of investors based on their understanding of the stock market. In addition, Baker and Wurgler (2006) also elaborate on investor sentiment, believing that investor sentiment reflects investors' investment tendency and represents investors' views and attitudes towards the stock market. At the same time, domestic researchers in China have also put forward their own views on investor sentiment. For example, Wang Meijin and Sun Jianjun (2004) point out that there are two main factors affecting investor sentiment, one is the psychological factors of investors, and the other is the cognitive bias of investors. These two factors lead to different investors' views on the risks of the stock market.

2.3 Stock Returns

Stock return is one of the common nouns in the stock market. In essence, stock return refers to the income that investors can get after buying stocks. On the other hand, if investors want to get income, then the price per share of the stock when investors buy the stock must be lower than the price of the stock when they sell it. In addition, the stock return also includes the dividend income of the stock. For shareholders, they buy stocks in order to make a profit from the stock market. At present, there are three main ways for stock companies to pay dividends, which are cash bonus, stock bonus and property bonus. Usually, most stock companies pay cash dividends directly to shareholders. In addition, there are some stock companies that do not pay cash dividends to shareholders. These stock companies are mainly in the stage of rapid development. For the sake of the continued expansion of their own companies, stock companies need to temporarily deposit more funds to maintain the need for further expansion of the company. At the same time, most investors pay more attention to the expected returns caused by stock price fluctuations, while fewer investors pay attention to the cash dividends paid by stock companies.

Figure 2 The elements of stock returns

3. Measures of Investor Sentiment

The focus and difficulty of in-depth analysis and research on investor sentiment lies in how to measure and evaluate investor sentiment. It is clear that measuring investor sentiment is not easy, mainly because investor sentiment is not obvious. Therefore, in the process of in-depth analysis and study of investor sentiment, the author believes that the key point is to quickly find a reasonable indicator of investor sentiment, which should also have two major characteristics, which are quantifiable and easy to obtain.

3.1 Indicators of Direct Investor Sentiment

Direct investor sentiment index is an important method to measure investor sentiment. Specifically, the main research method of direct investor sentiment index is questionnaire survey. To adopt direct investor sentiment indicators, we must scientifically and efficiently collect the views of major institutions on the late stage of the stock market and the attitude of individual investors towards the late trend of the stock market. Obviously, the indicator of direct investor sentiment is more intuitive and simpler than other indicators. However, it is worth noting that this indicator requires a lot of time and effort, so if you want to get a more accurate indicator of direct investor sentiment, you must invest a lot of construction costs. In addition, the index is also highly subjective and mainly depends on the subjective views of major institutions and individual investors.

3.2 Indicators of Indirect Investor Sentiment

Indirect investor sentiment indicators, in essence, do not directly use the survey method to ask investment institutions and individual investors their views and attitudes towards the late trend of the stock market. The indirect investor sentiment index is characterized by high data frequency and fast updating speed, in addition, the index is not limited by the subjectivity of the survey population. However, compared with direct investor sentiment indicators, indirect indicators have higher lag and contain more disturbing and irrelevant information. At present, foreign research scholar Delong et al. (1990) analyze and study the indirect investor sentiment index, and put forward the closed-end fund discount rate. In addition, through the study of indirect investor sentiment indicators, foreign researcher Stein (2004) believes that the relevant trading data in the stock market can also reflect investor sentiment, and points out that the turnover rate is one of the important indicators to reflect investor sentiment. Baker and Wurgler (2006) also analyze and study indirect investor sentiment indicators, and believe that the first-day issuance and rate of return of IPO are used as important indicators to reflect investor sentiment. Lu Xunfa and Li Jianqiang (2012) point out that in the stock market, the number of new accounts open by investors per day can also reflect investors' views and attitudes towards the future direction of the stock market. Wang Chun (2014) believes that the relevant trading data in the stock market can clearly reflect investors' views on the later stage of the stock market, such as the purchase of open-end funds.

3.3 Composite Indicators of Investor Sentiment

The comprehensive index of investor sentiment adopts both direct index and indirect index. Through technical treatment, it can measure investor sentiment more accurately, and has the advantages of both. Foreign researchers Baker and Wurgler (2006) adopt principal component analysis to study six indirect investor sentiment indicators, and integrate these six indicators as a comprehensive index of investor sentiment. The results show that the comprehensive index, which is composed of six indirect indicators, can fully reflect the investor sentiment in the stock market. At the same time, domestic research also studies investor sentiment in Chinese stock market. For example, Yi Zhigao and Mao Ning (2009) make the most of the research method of principal component analysis to combine a single emotional index to form a comprehensive index. The results show that, compared with direct indicators and indirect indicators, the comprehensive index can analyze investor sentiment in China's stock market more comprehensively and scientifically.

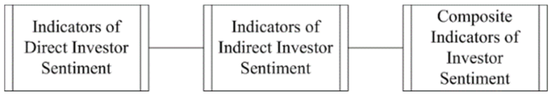

Figure 3 Measures of investor sentiment

4. The Overall Effect of Investor Sentiment on Stock Returns Under the Background of Big Data

In the initial stage, a large number of foreign researchers conducted in-depth analysis and research on the American stock market, and discussed the overall effect of investor sentiment on stock returns, in other words, it is to analyze the impact of investor sentiment on the overall stock return. Brown and Cliff take investor intelligence index as the proxy variable of investor sentiment, and analyze the relationship between investor sentiment and stock returns. The research shows that there is a correlation between investor sentiment and stock returns, but it is worth noting that investor sentiment can not affect the trend of the stock market in the short term. Therefore, in other words, investor sentiment can not accurately and comprehensively predict the future trend of the stock market. Baker and Wurgler (2007) use principal component analysis, combined with a variety of single indicators, that there is a significant correlation between the change of investor sentiment and the rate of return of the stock market.

In recent years, Chinese researchers have also begun to conduct in-depth analysis and research on China's A-share market. Wang Meijin and Sun Jianjun (2004) build a TGARCH-M model, and analyze the stock price fluctuations in Shanghai and Shenzhen stock markets.

5. The Cross-Sectional Effect of Investor Sentiment on Stock Returns Under the Background of Big Data

Baker and Wurgler (2006) make the most of principal component analysis to construct a comprehensive index of investor sentiment, and combined with nonparametric analysis and regression analysis to test the cross-sectional effect of investor sentiment. The results show that there are great differences in the impact of fluctuations of different types of stocks on investor sentiment. In addition, investor sentiment is more likely to affect stocks with smaller market capitalization. In short, these stocks which are easily affected by investor sentiment are characterized by small market capitalization, short listing time, high volatility, low profit margins and low dividends. In addition, these stocks are prone to skyrocketing and plummeting. Jiang Yumei and Wang Mingzhao (2010) make a further analysis on the relationship between investor sentiment and different types of stock returns. The results show that stocks vulnerable to investor mood fluctuations are characterized by low dividend yield, low price-to-book ratio, low price-to-earnings ratio and so on. Hu Changsheng and Tao Zhu (2017) make the full advantage of empirical analysis to believe that the impact of investor sentiment on stock prices is systematic and shows significant cross-sectional differences. In addition, if the market value of this type of stock is low and the proportion of institutional shareholding is low, it will be more easily affected by investor sentiment, thus showing an obvious emotional seesaw effect.

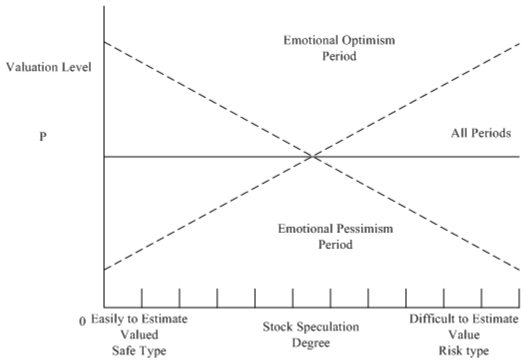

Figure 4 The schematic diagram of emotional seesaw

6. Conclusion

To sum up, under the background of big data, domestic and foreign scholars have conducted in-depth analysis and research on the relationship between investor sentiment and stock returns from multiple angles. In addition, the measurement of investor sentiment is not only the focus and difficulty of domestic and foreign research experts and scholars, but also a breakthrough. By combing the research literature of domestic and foreign scholars on the impact of investor sentiment on stock returns, the author finds that the method of investor sentiment strategy has gradually developed from a single agent index to a comprehensive index. At present, most researchers use empirical analysis and principal component analysis to analyze the relationship between investor sentiment and stock returns. The author believes that with the continuous development of big data's technology and the improvement of people's concept of financial management, the research on the impact of investor sentiment on stock returns under the background of big data is still a hot spot in the near future.

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